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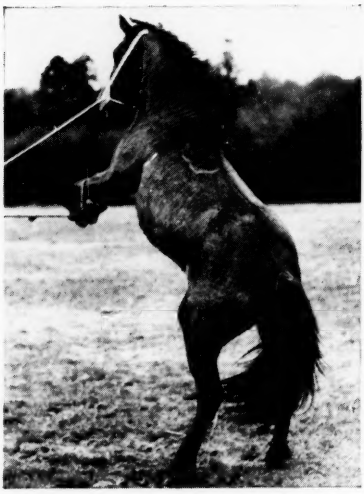

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EDITORIAL

REFLECTIONS AT THE END OF A YEAR

The term of a man's life is but a speck in the infinity of time. In many ways men are like the myriads of particles which dance merrily in a ray of the sun. Each one seems to be of little consequence in the galaxy, and if some sink to the ground in a state of apparent exhaustion, the rest just continue on their merry way and with no concern for their weak neighbours.

The tiny specks of dust which sparkle in the iridescent ray of light appear to flit and dance with some purpose. They rise and fall and tumble and turn like dancers on May Day. Their origin is obscure. In their brief life some are more magnificent than others and they glint and glimmer like diamonds, yet when the play is done all are equal as they return to the dust from which they came. Their life is not governed by any specific span and the flame can be snuffed at the whim of the sun. One could imagine that, during the brief period of their vivacious splendour, the movements of these specks reflect a conscious intent, some climb to the top of the ray with a determined vigour, others manage to hold a fair station in the melee of currents, and there are many who seem to give up the struggle and slide and sink to the depths in apparent despair.

A man's life resembles in many ways the kaleidoscopic gambols of these specks of dust. No one has solved with certainty the source of his origin nor yet his ultimate destiny. We do know that during his brief spell in the light he can acquire and implement some degree of control over his movement, action, and environment. He can pursue a conscious purpose in his relations with his fellows.

The length of his life is measured in units which coincide with the annual revolutions of nature. As each year flows to its end wise men pause and take stock of their estate in order to assess how their fortune has been cast by providence, what progress has been made, what advantage has been taken of opportunity and to make plans for the future. On these occasions it is interesting to recall and cogitate upon the resolutions, the hopes and maybe fears with which the year began. As a rule, and

for a variety of reasons, high and noble aspirations are never fulfilled completely and many of the hills towards which one directed an ambitious eye, remain to be scaled. Disappointment need not lead to despair, for frustration can act as a road to further effort and ultimate conquest. When one has tried and failed there is always some consolation in the knowledge that the things one had feared most in anticipation are never as dreadful when viewed in retrospect.

Men are gregarious animals for they like to live together. The conduct of the individual tempers the reactions of the tribe with which he lives and it is manifested also on national and international levels and in world affairs. How has the world progressed during this glorious sun-swept year of 1959? Two things come immediately to mind. The first concerns the great advances and discoveries which have been made by the men of science and particularly in the realms of physical research. The second is a pertinent question. Will the attempts to conquer outer space bring good to this world? The answer is a simple one, it all depends on how the newly acquired knowledge is used. Knowledge may be used for good, also it may be put to base purpose. The answer will not be given by science for science deals with factual matters and not those of the soul. If the new discoveries are to be used for benefit the lead must come from our hearts. In this regard 1959 has throbbed with hope. A short time ago and at the end of a year we drew attention to the dark clouds which overshadowed an anxious world and we made a plea for men to show more amity and trust in international affairs. The dark clouds rumbled on and on without respite until this year when the sun burst through with a faint gleam. Wise Statesmen have fanned that gleam and it bids fair to become a vigorous flame to illuminate and comfort the world. There is a chance that sentiment and friendly accord may assume their rightful place in men's affairs. They are the most powerful agents for good that can be devised and if they are given free rein then we and the generations to come can go about our business in the calmness of peace and goodwill.

SPONTANEOUS CARCINOMA OF THE URINARY BLADDER OF THE DOG

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Experience in this Department had suggested that carcinomas of the urinary bladder of the dog were uncommon tumours, but recently a larger number of specimens than usual have been received for examination. Thus, while in a series of 1211 tumours examined in 1940-1949 (Cotchin, 1951) there were 4 bladder carcinomas (0.33 per cent. of the total number of tumours), and in a succeeding series of 1150 tumours examined in the period 1950-1953 (Cotchin, 1954) there were three (0.26 per cent.), in the subsequent 5½ year period, 19 carcinomas of the urinary bladder have been examined in a series of 2160 tumours (0.9 per cent.) Twelve of the nineteen growths have been observed in the last 18 months. In this paper, an account is given of the 22 tumours examined since 1950. Relevant data are given in Table I.

TABLE I.

Showing age, sex, and breed of 22 dogs affected with carcinoma of the urinary bladder, together with clinical signs and their duration, and the pathological stage of the tumour.

Case No.	*Age (years)*	*Breed*	*Sex*		*Duration of signs*	*Stage of Tumour*
1	11½	Scottish T.	M.	Inclined to dribble urine	6 months	2[1]
2	4	Corgi	F.	Haematuria	1 year	1B
3	5	Retriever	M.	Haematuria	2 months	1B
4	12	?	M.	Haematuria	Several weeks	2[2]
5	10	Scottish T.	F.	?	?	1A
6	6½	Mongrel	F.	Haematuria	6 months	2[1]
7	8	Corgi	F.	Difficulty in micturition	?	2
8	8	Spaniel	F.	Haematuria	1 week	1B[2]
9	10	Scottish T.	M.	?	?	1B
10	Old	Spaniel	F.	Bloody vaginal discharge	3 days	4
11	8	Scottish T.	F.	Haematuria, polyuria	?	2[2]
12	10	Corgi	F.	Frequency and straining	?	2
13	9	Spaniel	F.	Ruptured bladder (short period of frequency)	2 days	1B
14	10	Scottish T.	M.	Haematuria	2 months	1A
15	12	Spaniel	M.	Haematuria	2 years	1B
16	11	Scottish T.	M.	Haematuria	?	1B[2]
17	13	S.H.F.T.	F.	Acute retention	4 days	2[2]
18	7	Spaniel	M.	Haematuria	Chronic	1B
19	10	Scottish T.	F.	Haematuria	Several weeks	1B
20	6	Collie	F.	?	2 days	1A[2]
21	8	W.H.F.T.-X	M.	Incontinence	7 weeks	1B
22	8¼	Retriever	M.	Frequency, pumping	1 year	2[1]

[1] = autopsy by writer
[2] = operation case

The ages of the dogs ranged from 4 to 13 years, averaging 9 years. There were 10 males and 12 females (one of which—case 10—had been castrated 6 years previously). The breeds represented were Scottish Terrier (7 dogs), Spaniel (5), Corgi (3), Retriever (2), Wire Haired Fox Terrier-cross, Smooth Haired Fox Terrier,

Collie, mongrel, one each. In one case, the breed was not recorded. The chief clinical sign noted was haematuria, lasting for periods up to 2 years (observed in 11 dogs). Some animals exhibited frequency or incontinence and difficult micturition. One dog (case 17) was affected with acute retention, and rupture of the bladder occurred in another due to erosion of the bladder wall (case 13).

In 6 instances, the tumours were removed by surgical means (cases 4, 8, 11, 16, 17, and 20): post-operative histories were obtained for 4 of these dogs.

Case 8: The operation was performed in March 1956, but it was not successful and the animal was destroyed. No autopsy was made.

Case 11: Operation in January 1958. After a temporary recovery, symptoms suggesting nephritis were observed. The dog was destroyed, but no autopsy was possible.

Case 17: Operation in September 1958. The dog made a good recovery after operation, but symptoms recurred in April 1959. No autopsy was possible, but palpation, at the time of euthanasia, revealed a hard mass the size of a walnut in the region of the bladder.

Case 20: This dog showed diffuse lesions all over the ventral wall of the bladder. Complete removal was not feasible. Three doses of deep X-ray therapy were given in May 1959. Two months later, the bitch was reported to be well.

Three of the specimens were obtained by the writer at post-mortem examination (1, 6 and 22). The other specimens were submitted by surgeons after laparotomy and destruction of the affected dog.

Macroscopically, the lesions were seen either as single or multiple papillary projections on the mucosa of the bladder, or as local or diffuse thickenings of the bladder wall, or as both papillae and thickening (fig. 1). The papillae were friable, and grey or dark-red in colour. They tended to be multiple and rather widespread on the mucosa, particularly affecting the fundus region. In one dog (case 17), the growths involved each ureteral orifice. Often the thickening of the wall of the bladder was diffuse, being partly due to muscular hypertrophy, but a more marked local thickening might indicate the actual site of the carcinoma, which, in most instances, was ulcerated.

Histologically, the tumours are transitional-cell carcinomas (Figs. 2, 3 and 4), which have an obviously papillary component in at least 16 dogs. In 3 dogs a variable degree of anaplastic change is present. The papillary component shows single or multiple simple or branched projecting cores of connective tissue covered by transitional epithelium, with secondary projections, or crypt-like foldings at single or multiple sites. In most of the specimens the papillae show many stromal capillary vessels.

The carcinomatous areas are composed of narrow or wide columns of cells which have large (10-12 μ), oval, pale nuclei, usually with a prominent single nucleolus, and a variable and sometimes large amount of cytoplasm, which, as a rule, stains rather weakly and may even appear almost clear. Mitoses are regular and numerous, except in some anaplastic areas, where some large single nuclei are present and irregular mitoses are seen. The cells tend to be larger towards the centre of the columns, and in one or two instances an appearance suggesting a cell-nest is seen (fig. 4); there are

however no definite keratinizing centres. The centrally-placed cells may degenerate, become smaller and show red-stained cytoplasm, and a false lumen may appear in the columns to give a duct or tubule-like structure. In most tumours, isolated cells, often in considerable number, may appear to shrivel up and lie in a large clear space (similar to what is seen in canine seminomas): sometimes the rounded spaces are not quite clear and contain a faintly bluish-staining material. A few nuclei appear enlarged, vacuolated or ballooned.

By analogy with the staging of cancers of the human urinary bladder referred to by Dukes and Masina (1949), three of our tumours were in stage IA (with invasion of the mucosa), 10 were in stage IB (with invasion of the muscularis), 8 were in stage 2 (with spread to the serosa), and one was in stage 4 (with distant metastases not removable in continuity at operation). The last named (case 10) was in an aged Cocker Spaniel bitch, which had been subjected to ovarohysterectomy 6 years previously. Six months before the bitch was destroyed, there had been a bloody discharge from the vagina. This recurred three days before destruction. The bitch rapidly became anaemic. Exploratory laparotomy revealed widespread tumours and the bitch was destroyed. The urinary bladder showed a transitional-cell carcinoma, forming a bulging, white, rounded, opaque mucosal focus, 0.6 cm. in diameter, with local mucosal haemorrhage. These were multiple scattered white opaque foci in the lungs, up to 0.2 or 0.3 cm. across, and there were 2 or 3 dozen similar foci in the kidneys just below the surface of each cortex. Histologically the bladder and lungs show rather solid masses of carcinoma cells.

Invasion of the bladder wall is chiefly by way of tissue spaces, but in 5 dogs lymphatic vessels are invaded, and in 4 there is invasion of venules (including the dog with metastases).

Invasion of the muscularis may be by solid or by " lumenated " columns of cells, or by smaller cell-groups, or even by single cells. In most instances, invasion is most obvious between the muscle bundles but in 4 dogs (16, 18, 21, 22) the tumour cells are invading the muscle bundles mainly and not the interstitial tissue.

Discussion

Although the dog has been used successfully for the experimental production of cancer of the urinary bladder, spontaneous tumours have not been reported very often. Bloom (1954) stated that bladder cancers occur occasionally in dogs, but he did not specify how many cases he had seen. Kast (1954) collected references, dating back to 1871, to 15 epithelial bladder tumours in dogs; three were cases of the present writer's, and are included in the present series. Kast added two further cases, one of which was a transitional-cell carcinoma in a 6-year-old Airedale bitch, with metastases in the iliac and lumbar lymph nodes and in the lungs. Five (or possibly 7) of the cases collected by Kast showed metastases.

From our experience at the R.V.C., it would seem that cancer of the bladder may not be so uncommon in dogs as it was once thought to be. It is very difficult to say whether it is increasing in incidence, and judgment should be reserved for the time being.

The cause or causes of these spontaneous bladder cancers are not known, and so far no special biochemical analyses of urine from affected dogs has been made. To

see whether these dogs had possibly been exposed to some chemical substance that could be of aetiological significance, some enquiry was made into the diet of the dogs, with particular reference to whether or not they had received green-marked knacker or other meat. At the same time, enquiry was made to ascertain if they had eaten dog biscuits or canned pet foods. So far information about these components in the diet has been obtained for only 10 of the affected dogs, and, as shown in Table II, it gives no indication where a possibly significant ingested substance might be found.

TABLE II.

Showing whether diet of dogs with spontaneous bladder cancer contained green-marked meat, canned pet food, or dog biscuits.

		Dietary component	
Case No.	*Green-marked meat*	*Canned pet food*	*Dog biscuits*
2	+	0	0
10	+	0	0
11	0	+1	0
12	0	+	0
14	+	+	0
15	0	0	+
17	0	0	+
18	0	+	+
19	0	+2	+
20	+	+	+
	1—occasionally	2—rarely	

Summary

An account is given of 22 spontaneous carcinomas of the urinary bladder of dogs.

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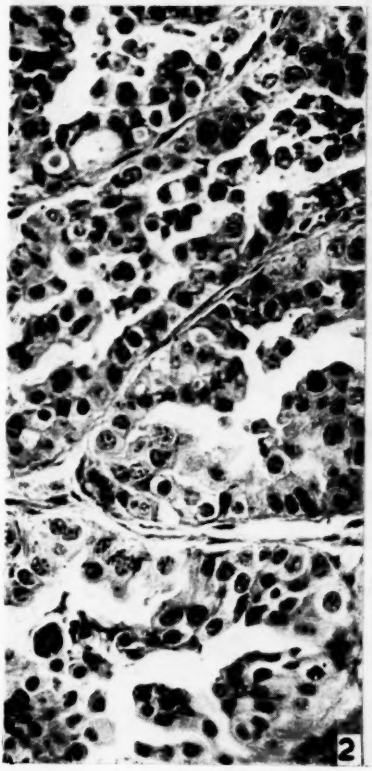
FIG. 1
Carcinoma of urinary bladder of 10-year-old Corgi bitch (case 10), showing multiple projecting lesions of the mucosa, and thickening of the wall. Scale in cm.

FIG. 2
Transitional-cell carcinoma of the bladder of 10-year-old Scottish Terrior bitch (case 5). H. & E. x340.

FIG. 3
Carcinoma of urinary bladder of 8-year-old spaniel bitch (case 8), showing transitional-cell structure (below) and anaplastic carcinoma (above). H. & E. x200.

FIG. 4
Carcinoma of urinary bladder of 7-year-old Spaniel dog (case 18), showing a cell-nest like structure in column of tumour cells invading muscularis. H. & E. x250.



(Article by Cotchin, page 431)

THE PROBLEM OF THE AGEING ANIMAL: PHYSIOLOGICAL ASPECTS—I*

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Before proceeding to discuss the cause and effect of the process of ageing in animals, one must attempt to define the terms ' ageing ' and ' senescence ' which are often used as synonyms. I use the word attempt because in searching the literature on the ' ageing process ' I notice that many erudite scientists have failed to agree on an all-embracing definition of the term ' ageing '. Some take the extreme view that the ' ageing process ' is initiated during intrauterine life beginning even at the time of conception. Others stress the fact of a differential growth rate in different organ systems so that the ageing process proceeds with varying momentum in different regions of the body. For example the tissues of the placenta and the formed elements of the blood, the nucleated cells as well as erythrocytes, have a very short life span but show a wonderfully labile replacement mechanism. Other body tissues also show a great ability to regenerate, for example the cells of the mucous membrane of the alimentary tract and of the epidermis, but nerve and myocardial cells are very restricted in their ability to regenerate. " Ageing " of tissues can, therefore, be said to occur at many stages during an animal's lifetime and is not confined to the terminal stages. Probably it is better to use the term ' senescence ' for the terminal stage in life when an animal grows old after growth has ceased and a decline from full physical development and fitness begins to show itself (see Comfort, 1954). Senescence is a process of deterioration usually associated with an obvious change in conformation, vitality and strength. The changes manifest in domesticated animals showing senility are well known; e.g. the slow plodding gait, the change in demeanour, and the greying muzzle of the senescent dog. In the thoroughbred horse a striking difference in conformation is seen between the 3-4 year old in its racing prime and the aged stallion towards the end of its stud life.

In contrast to the detailed life tables compiled for man there are very few data available for animals. Animals in the wild state seldom attain old age, or anything like senility, and as a rule the species that have been domesticated are kept for economic reasons and are removed when their productive capacity begins to fall. Longevity in animals cannot be stated with actuarial precision. It must be estimated from isolated records of single animals. These records may be of dubious value because of common human frailties. Authenticated maximum ages of some of the domesticated animals quoted by Comfort (1954) are as follows: horse and other equidae up to 60 years, goat 20 years, cats up to 30 years, dogs seldom more than 18 years. Some figures relating to birds that may be of interest are the parrot 54 years, domestic goose 35 years, domestic pigeon 30 years, domestic hen 12 years. Smaller birds usually live only a few years although records show that some live more than ten.

**Presented at a meeting of the Central Veterinary Society, February 1959.*

From the meagre number of records that have been collated it appears that in any population of animals under natural conditions there is an arithmetical linear fall in population rate. This means that from the original population, at about half-way through the life span of the species, only about half of the original group survive. In populations of dogs the data suggests that the larger species such as wolfhounds age biologically more quickly than smaller breeds such as spaniels. All species show a sex difference in relationship to longevity, the female showing a small but definite longer life-span. In the domestic fowl (see one set of records, Gardner & Hurst, 1933) the hen shows a very much greater expectancy of life than the cock (F 5 yrs. M 3 yrs.) In man actuarial life-tables show an inverted L type of life-span, during the flat part of the curve the death rate is low, the high death rates of the older age groups producing the steep part of the curve. The difference between the pattern of animal wastage compared with the life table of twentieth century man is due to the process of civilisation with its concurrent protective measures such as medical services, adequate housing and the provision of an optimal food supply. It is likely that similar factors can affect the life span of many animals when they become domesticated. I suggest that if life tables could be obtained for cows in an unattested population and compared with those of an attested population significant differences might show when the hazard of *M. tuberculosis* is removed. Again, comparison of the life span of a pig population under conditions of good husbandry and antibiotic feeding would surely vary from that of a population of pigs kept under the adverse conditions which often obtain for these animals. I feel sure that genetical factors within some families of a breed will show as definite variations in longevity and the onset of senescence; the presence or absence of horns in cattle could be of significance in this respect. The production of achondroplasia by selective breeding in some dogs gives rise to changes which lead to some respiratory impairment. One should note too that cardiac malfunction is a common feature in achondroplastic dogs and frequently it is a cause of early death. Breeding of domestic animals for high yield, e.g. in cattle and poultry, is often associated with dysfunction of metabolism with consequent high wastage. This is of great importance when it is realised that a dairy cow only becomes an effective economic proposition during its third or fourth lactation.

With regard to the factors that cause the onset of senescence there is little absolute knowledge. This is due to the fact that the physical changes which we all know to be associated with senescence, for example, change in the colour of hair, diminution of visual and auditory acuity, variation in the deposition of fat and muscle tone which produce changes in conformation, are not brought about by any single factor. A great number of theories have been brought forward to account for the process of senescence and I shall mention some of them briefly.

The relationship of nutrition to longevity and senescence is an interesting problem. It has been shown that in rats the life span can be increased markedly if the animals are fed during the early growing period on a balanced diet which is deficient in calories. It appears that subnormal diets during the period of maximum growth, delay such important metabolic events as the development of bone as well as the physiological development of organs like the gonads which delay the onset of puberty. It is of interest to compare European cattle and Zebu cattle in this respect for the latter do not have their first calf, which is usually associated with the first effective

oestrus since these animals run in herds, until they are in their third year (Bell, 1944). It is likely that the restricted diet associated with range conditions plays a part in causing this wide difference. In most of our domesticated animals, which are kept for productive purposes, the reverse to retardation of growth probably obtains. The feeding of balanced diets with antibiotic and hormonal supplement probably induces early maturity which is the desired result from the economic point of view. On biological grounds this is not significant since the continuation of the species has been assured.

The ageing of cells especially of highly differentiated cells such as the neurone and cardiac muscle has been studied and specific changes such as the acquisition of pigment have been demonstrated. Electronmicroscopy has shown changes in the arrangement of mitochondria of old cells, the mitochrondria fragment and lose their normal structure. This histological change in the mitochondria probably affects the intracellular biochemistry and occasions a derangement of the normal function of the cell. Cells that are normally quite labile and reproduce during life by mitosis, such as the cells of the kidney and the liver, lose this ability to regenerate in an old animal. In senescent dogs it has been shown that epithelial tissues of the liver and kidney are unable to produce the normal repair processes exhibited by similar tissues in young animals. This failure of the parenchymatous organs to regenerate is accompanied by demonstrable physical changes in the collagen and elastic of the ground substance of organs. This change in the physical characteristics of supporting substances of the body is probably brought about by changes that occur in fluid matrix, the interstitial fluid which provides the environment of all cells.

It is believed that the acid-base regulation of the old animal is impaired mainly by a reduction in the reserves of alkali. In addition the senescent cell shows an increase of water content. It is known that the blood supply to certain organs decreases with age usually producing a diminution in the supply of nutrients such as oxygen and glucose.

As age advances, cells and tissues show important changes in susceptibility and resistance. In some ways a mature or aged animal is less susceptible and more resistant than the immature animal, for by meeting adversity in the form of epidemics it has become immune to such conditions. The older animal is less vulnerable to its environment than the young animal. Because of the deterioration in the viability of its individual cells the senescent animal becomes less adaptable; it is much less resilient in the face of violent change in its external environment for its homeostatic regulatory mechanism is becoming less efficient. A senescent animal reacts more violently to extremes of heat and cold. The provision of an equible environment is obviously good practice in the management of old animals.

Many investigations have suggested that the endocrine system provides the key to the process of senescence, especially in the interrelationship of the gonads and the anterior pituitary. In the domesticated animals the gonads do not show any well defined senile processes comparable to the involution seen in the human subject. For example an authentic case is recorded of a 46 years old mare that produced her 34th foal when she was 42. The adrenal gland, especially the adrenal cortex, shows little change in the senescent animal although the excretion of 17 ketosteroids diminishes with age. Pituitary thyrotrophic hormone on the other hand seems to show maximum

output at puberty and then to show a decline although analyses have not been made in old age. It would appear that the endocrine system itself does not provide the 'master factor' in senescence but it probably correlates closely with other homeostatic mechanisms which affect the internal environment of the animal.

From the practical point of view veterinary surgeons will be confronted mainly with senescent patients only from within the group of domestic pets. Since senescence is an individual process each animal will show changes which reflect the hazards it has encountered in its earlier life; it is possible that certain viruses have left their toll on the neurones of the brain and that leptospira have affected the kidneys. Signs of this will be displayed by the cardiovascular system due to a diminution of efficiency in the heart and arteries. These cardio-vascular deteriorations will be reflected in the performance of the liver, lungs and kidneys. Since these organs themselves will be showing irreversible changes associated with senescence, if the cardiovascular deficit sets in at an early stage, then obvious changes will occur at an earlier stage in the parenchymatous organs. These early changes will be manifest through the development of such signs as ascites and emphysema, or in biochemical changes such as uraemia or anaemia. It is unlikely that in old age the animal succumbs to any single entity or that senescence itself produces death. Post-mortem examination of senile subjects usually reveals a number of lesions such as tumours, vascular defects and chronic lesions of various organs. In a group of 57 old dogs examined post-mortem the cause of death was ascribed to respiratory defects in 22%, nephritis in 21%, cardiac defects in 14%, tumours 14% and the remainder to a variety of causes. It is worth noting that aged animals withstand stress worse than young animals, this especially, for example, in the more marked toxic effects of anaesthetics and various alkaloids on the liver and heart.

The veterinary clinician will not be concerned with the psychological problems which are very often a major concern in the treatment of old people. The nursing of the old patient will not normally be a problem, for those clients presenting their old animals for treatment are usually very willing to look after them. Deterioration of the special senses which occur in old animals such as blindness and deafness cannot be treated in veterinary medicine by the provision of physical aids as they can in man but this should not matter very much, for the animal can expect the protection provided by the owner.

I wish to emphasise that the experimental and factual data appertaining to senescence in the domesticated animals is scarce. This could well be rectified in the future, for it so happens that a number of our equine patients are maintained and protected in old age at various homes of rest. I think too that it should be possible to obtain similar data for dogs, for the racing greyhound would provide a fairly uniform and genetically stable population which would be excellent for such investigations. Collection of information on cattle in certain countries of the East where because of religious scruples cattle are never slaughtered should provide a wealth of material for the study of the processes associated with senescence in this species.

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THE PROBLEM OF THE AGEING ANIMAL : A PRACTITIONER'S THOUGHTS*

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Fareham.

Regeneration of tissue is at its lowest ebb in old animals. It is seldom possible for an old dog to resolve completely from the effects of disease and return to full health and vigour. This fact holds good in the case of senescence. As a rule our efforts must be directed towards the alleviation of the deleterious factors and thereby prolong life for a time. It is impossible to rekindle the vital spark of life for other than a temporary period. Taking the long view it might be dangerous to increase the vital metabolism of tissues which show the normal effects of wear and tear and are incapable of regeneration. It is a sad fact that when an old animal is affected with a disease it is seldom possible to effect a complete resolution in the same sense that it is possible to return a younger dog to full health and vigour. The most that one can expect in the elderly, is a return to its previous stage of senescence. In other words it is only possible to alleviate the troubles of old age and thereby prolong life for a period. This is justified only if it is with comfort to the patient.

Alleviation is, in my opinion, the key to the clinical approach. Due to the physiological changes of advancing years it is common to be confronted with a dog that is suffering from a multiplicity of co-existent troubles, and it is usually unwise to try to treat all of these conditions at one and the same time. Indeed it is sometimes dangerous to do so. This applies in particular, to those diseases of a balancing or compensatory nature. It is best to tackle the particular condition which is paramount at the time. If we can promote some alleviation the dog will be made more comfortable and have a better chance of returning to his pre-existent state.

One should plan to deal with the effects of age in a systematic manner because the deterioration in one system may overlay that in another in the case in hand. It is reasonably correct to say that our health and vigour depend on what we eat; it is equally correct with regard to the dog, so that the logical starting point, to my mind, is the gastro-intestinal tract.

The mouth should be inspected periodically in all dogs but more especially in those over 6 years. All tartar and decayed teeth must be removed and in most cases when this is done inflamed gums and indeed pyorrhoea will clear up. It is quite surprising what a new lease of life this simple operation will give to an old dog. It is reasonable to expect beneficial results because poisons absorbed from decaying teeth can upset the whole of the digestive process and lead to serious intestinal disturbance.

Pharynx and oesophagus. Apart from removable tumours it is seldom that one encounters in an aged dog any trouble that is of clinical moment to the preservation of his life.

The stomach and intestines. Advancing years lead to decreased powers of digestion and loss of tone of the intestinal muscles, and no doubt there is a decrease in the secretion and efficiency of gastric and intestinal juices also. It is common for an elderly dog to suffer from flatulence and more especially from constipation. The

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faeces become hard and brittle and the old dog may suffer terribly when he attempts to evacuate this mass.

The answer to these troubles is to ensure that the diet is nutritious, light and easily digestible and suited to the requirements of the individual dog. Owners often fail to appreciate that as the dog advances in years his diet needs to be adjusted. The traditional diet of meat and biscuits requires to be changed to a more concentrated and digestible form of protein, carbohydrate and fat. It must be borne in mind that dogs will often resent alteration in their diet and it is unwise to do this suddenly, as it may aggravate any digestive upset that may be present and lead to vomiting and diarrhoea. Changes in diet should be gradual.

In the early stages of intestinal trouble, liquid paraffin is an excellent aid in keeping the bowels free. It softens the dry brittle mass and lubricates the bowel. Liquid paraffin does not overcome the loss of muscle tone. It is essential to give the necessary bulk that will stimulate muscle reaction and enable the bowel to work naturally. For this purpose the vegetable properties of iso-gel, psyllium seed and allied substances are excellent. I use them extensively and find them of the utmost value for overcoming loss of tone in dogs of all ages, but especially in the elderly.

Tumours of the stomach are rare, and so in my experience, are ulcers, but tumours of the intestines are quite common—but not more so in the elderly than in the young. One can do very little other than bowel resection and this is unwise unless the tumour obstructs the gut and it is definitely proved to be benign.

The rectum presents few remedial troubles that shorten life. Now and again one meets with severe loss of muscular tone, leading to a great ballooning effect. It becomes impossible for the dog to evacuate without manual assistance. These cases will respond sometimes to iso-gel or allied substance in conjunction with prostigmin in high dosage or alpha tocopherol in high dosage—150 units per day.

The anus and surrounding tissues are a constant site of trouble to the old dog. Impacted anal sacs trouble old and young dogs. When seen in the early stages they respond well if an antibiotic is introduced into the sacs. In more chronic cases surgical excision of the whole gland can effect a complete cure. The worst troubles in the anal region are inflammatory reactions involving the circumanal glands.

Hyperplasia and tumours. The latter sometimes lend themselves to surgical intervention and sometimes, especially in the early stages, resolution may be effected by deep X-ray therapy. Stilboesterol and cortisone may give excellent results.

The next part which attracts my attention is the *uro-genital system.* Starting first with the kidney—I have yet to see an elderly male dog that is not affected to a greater or less degree with chronic nephritis. I seldom find the same state of affairs in the female, although it is reported that at least 80% of all dogs over 8 years of age suffer from renal trouble—usually chronic nephritis. This condition arises not from the normal physiological changes of senescence but from progressive damage occasioned by leptospiral, viral and bacterial disease. When there is compensation without uraemia the predominent symptoms will be those of thirst and polyurea. The blood chemistry remains normal. In these cases free access to water, a not too rigorous restriction of protein, elimination of salt and the removal of septic foci, such as teeth, otitis etc., prevention of constipation and exposure to cold and damp, will help to alleviate the trouble very considerably. On the other hand it is difficult to control

the ill effects of chronic uncompensated nephritis when clinical signs of apathy, depression, gradual loss of weight, arching of back, stiff gait, pruritus, anaemia, anorexia, thirst, vomiting, diarrhoea or constipation and foul ammoniacal breath are manifested. In cases which respond to treatment the therapy most likely to give relief is 5% dextrose with saline if uraemia is present, as evidenced by vomiting. It is my custom to give 100-500 cc subcutaneously daily plus antibiotics. Testosterone 10-15 mgm daily is also helpful. It is said to increase the patency of the renal tubules. Vitamin E is beneficial also because of its action upon the circulatory system as a whole.

Bladder. In my experience chronic cystitis is not particularly common. I have seen one case only in the last 12 months. The characteristic signs are frequent urination, haematuria, dysuria and pain. It may or may not respond to antibiotics and/or urinary antiseptics. Usually an improvement is only of a temporary nature and recurrence is rapid and further treatment is of no benefit with the possible exception of X-ray therapy.

MALE GENITAL ORGANS: *Testis*—senile atrophy, nodular hyperplasia and tumours. Although these conditions can be distinguished by pathological and clinical means the end results are parallel i.e. alteration of male characteristics, depression, alopecia, feminization and pruritus. The most effective treatment in all cases is effected by surgical removal. This often yields quite startling results with benefits registered in the dog's general health and well-being.

Prostate. Atrophy causes little or no trouble. It is seldom diagnosed in life and from the clinical point of view it is of little importance. Hyperplasia on the other hand is a potent source of trouble, it leads, by straining because of pressure on the rectum, to constipation, retroflexion of the bladder or perineal rupture to urethral compression and severe hypertrophy of the urinary bladder. Hyperplasia may be associated with cystitis, hydronephrosis and pyelonephritis. The administration of oestrogens gives some benefit but there is some danger from possible overdosage. Overdosage may lead to further enlargement, feminization, anaemia, leucocytosis, leucopenia, or thrombocytopoenia. Oestrogens may make the last state worse than the first. For the bold surgeon, prostatectomy is a quick and efficient remedy and for the not so bold or dextrous surgeon, castration is also effective although the benefits are longer delayed.

FEMALE: *Vagina*—tumours of the benign type are the commonest trouble and many may be removed with good results.

Uterus. Hyperplasia, endometritis, metritis, pyometra and tumours. These troubles give rise to different clinical signs but to my mind the only rational treatment for the lot is ovaro-hysterectomy. The bitch is not likely to be required for breeding purposes and the operation obviates many later disturbances of health and certainly gives the bitch a new lease of life, parallel with the removal of a diseased testis in the male.

Mammary Glands. Fibrocytic disease is a precursor of malignant tumour and the lesion should be excised. I am of the opinion that the benefits are enhanced if the operation of ovariotomy is performed at the same time.

XUM

Tumours both benign and malignant should be excised and I believe it is dangerous to perform the operation of ovariotomy at the same time.

I must say something about the heart as disorders of this vital organ are met with so frequently in old dogs.

Fatty infiltration is met with in the fat, overfed, under-exercised household pet. The signs are obvious—lethargy, breathlessness, a weak, maybe irregular, pulse and weak action of the heart. I find that complete rest, preferably in a kennel and a low diet for 2-3 weeks gives very beneficial results.

Chronic Valvular Disease. Aberrations in the functions of the valves of the heart and of a chronic nature are met with very frequently in old dogs. It is not always possible to pin-point a cause. Overexertion, chronic nephritis, excitement, cold, distemper, have all been blamed. All may play their part but the disorders are noted so frequently in old dogs that I believe that in many instances it may be a direct consequence of senile change. Brown atrophy of the myocardium is associated often with senility.

The outstanding clinical symptom is cough. The cough becomes accentuated and more persistent with exercise and the dog will tire quickly. Other signs such as gastro-intestinal disturbances, vomiting, diarrhoea, oedema and ascites go hand in hand with the cough. Digitalis and vitamin E are valuable therapeutic aids and it is important to avoid undue excitement. I find the following prescription, for which I am grateful to Mr. Hamilton Kirk, gives excellent results:—Tinct. Digit: M xl. Tinct. Camph: Co: Drachms 2. Vin: Ipecac: Drachms 2. Syr: Scillae ad Fl Ozs. 2. One dessertspoonful three times daily. I give 50 mgm. of vit. E daily also. I have kept dogs on this treatment for upwards of 2 years and they have remained reasonably well and active all that time.

Respiratory System. Hyperkeratosis of the nose occurs frequently especially in spaniels. I find that massage with mineral oil or hydrocortisone ointment gives useful results

Nasal Cavity and Sinuses. Tumours usually unilateral occur quite frequently. Often they are of a malignant nature and give rise to discharge, haemorrhage, sneezing, snoring and mouth breathing. Unfortunately most of these tumours do not respond to medical or surgical treatment. X-ray therapy has a beneficial effect in some instances.

Lungs. Elderly dogs can suffer from senile atrophic emphysema, anthracosis, calcification, ossification, broncho-pneumonia, nodular hyperplasia and tumours of the lungs. None of these conditions causes old dogs very much inconvenience with the possible exception of rapidly growing tumours. Whilst it may be very trying for the owner, chronic broncho-pneumonia inconveniences the dog very little. Some antibiotic treatment may be required but the main line of attack rests on good diet, maintenance of fluid intake and good nursing. It is then surprising how the old dogs will keep going if these simple lines of treatment are pursued.

Intrepid surgeons may attempt to remove tumours. I have never yet had the opportunity to try and I doubt if it is wise to subject an old patient to such a serious ordeal.

Skin. Senile changes are manifested mainly by loss of elasticity. Hyperkeratosis of

the feet and skin of the elbows is of common recurrence. Trimming of the feet and application of 10% salicylic ointment or a hydrocortisone ointment will often work wonders.

Cutaneous Horns. Projecting horny structures of hyperplastic stratum corneum can be removed easily in most instances with the knife.

Chronic skin disease can take many forms and be caused by a great variety of factors bacteria, fungi, diet, metabolism, allergy, hormones etc., etc. Any or all of the foregoing can lead to pruritus, alopecia, hyperpigmentation, hyperplasia, eczema and dermatitis.

The treatment depends upon the cause. At times it is very difficult to specify a cause. It is surprising how frequently gonadectomy will effect a remarkably good result. When a specific cause can be found then the appropriate treatment can be applied. I have found in the past that a low grade anaemia is not an uncommon cause of skin irritation in old animals. The anaemia is sometimes combined with a leucopoenia. In this type of case iron and vitamin B12 are remarkably effective. If only partial success is achieved by these agents then the addition of cortisone will usually give the final answer by overcoming the leucopoenia.

Tumours. Almost every known type of tumour, both benign and malignant affect the skin. A very high percentage of both types can be excised successfully. In some cases the malignant type can be kept under control with cortisone for a period but in course of time they become refactory to this therapy.

Ears. Deafness is quite common in old animals and probably it is due to senescent changes in the auditory apparatus. I know of no cure.

Chronic external otitis. Aural resection is most effective in those cases that become refactory to simple treatment. Medicaments are legion but I find that proflavine emulsion is the most consistently successful. I have tried every medicament that has come to my notice and constantly have recourse to this product. In recent times I have had encouraging results when hydrocortisone ointment or aural drops have been used.

Eyes. The two commonest types of senile change that are met with in old dogs are cataract and pigmentary keratitis. The first condition may require the lens to be extracted.

Until recent times I would have said that pigmentary keratitis was very disappointing in its response to treatment. Now I have found that prednisolone either topically or parenterally will effect quite startling results.

These notes are very sketchy and in fact I have not even mentioned the locomotor system, endocrine glands or the nervous system. When collecting my observations on the clinical considerations of the elderly dog I thought that I could not possibly talk for 20 minutes on the subject. I have found that I could write a book about it. perhaps I will!

XUM

AN IN VITRO INVESTIGATION INTO THE ANTHELMINTIC PROPERTIES OF A PHENOTHIAZINE AND HEXACHLORETHANE COMPOUND*

A. SHARAF, Ph.D., M. H. HAIBA, Ph.D., and I. M. SHIHATA, M.D.

Introduction

In vitro studies on the anthelmintic effect of different drugs on taenia and ascaris infesting dogs and on fasciola worms infesting buffaloes, cattle and sheep have been recorded. [Sharaf and Shihata (1955); Sharaf, Haiba and Shihata (1959)]. The investigations were made in an attempt to show the pharmacological basis for the proper application of the different anthelmintic drugs. The purpose of the present work is to investigate, *in vitro,* the effect of a combined preparation and phenothiazine and hexachlorethane on different worms and to show whether this compound is of benefit in treating mixed parasitic infestation. The investigation concerned *Fasciola gigantica* of buffaloes, *Ascaris vitallorum* of cows and *Dipylidium caninum* of dogs. The intestinal motility was observed also.

Materials and Methods

A fluke and worm drench (powder)** was used. It is a scientific blend of phenothiazine and hexachlorethane in the form of a "wettable" powder. Fresh solutions were prepared by adding the powder to Tyrode's solution and the suspension was shaken thoroughly before use. Fasciola, ascaris and taenia worms were collected from buffaloes, cows and dogs and pieces of the intestines were dissected. The specimens were kept in Tyrode's solution in order to examine their response *in vitro* to the preparation to be tested. The whole of the fasciola worms, the upper part of ascaris, few segments of taenia and strips of the intestines were suspended in oxygenated Tyrode's solution at a constant temperature of 38°C. A glass jar bath with an inner vessel of 50 ml. capacity was used. After recording the normal motility of fasciola, ascaris, taenia and intestines on a slowly moving smoked kymographic paper, the effect of different amounts of the drug was ascertained by adding it to the solution in the bath.

Results

The fluke and worm drench (powder) up to 2 mg. had no effect on fasciola, on ascaris up to 5 mg. and on taenia up to 0.5 mg. when added to the 50 ml. bath. When the amount of the drug was increased consistent stimulation of the motility of the worms was noted. No effect was noticed on the intestines by amounts of up to 5 mg.; stimulation was produced only by doses of from 10 to 20 mg. Slight stimulation followed by inhibition of the intestinal motility was obtained with doses of 50 to 100 mg. The effect is shown in table I and demonstrated by figures 1 to 5.

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**Cooper, McDougall and Robertson Ltd. product.

FIG. 1.
Showing the effect, in vitro, of 20 mg. of the fluke and worm drench powder on Fasciola worm of buffaloes when added to 50 ml. bath.

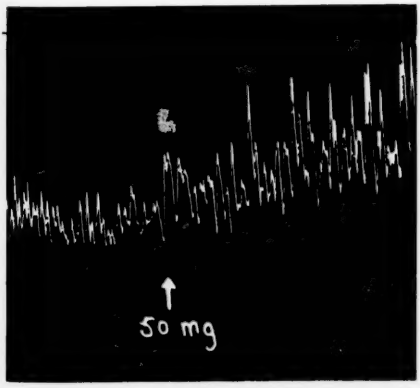

FIG. 2.
Showing the effect, in vitro, of 50 mg. of the fluke and worm drench powder on Taenia worm of dogs when added to 50 ml. bath.

(Article by Sharaf, page 444)

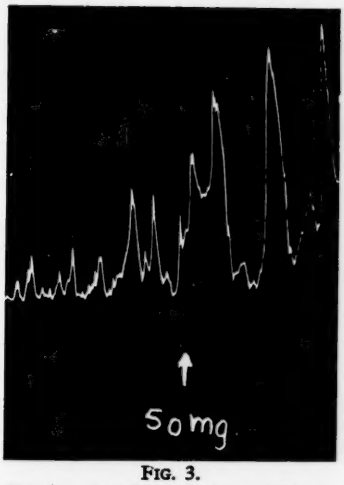

FIG. 3.
Showing the effect, in vitro, of 50 mg. of the fluke and worm drench powder on Ascaris worms of cows when added to 50 ml. bath.

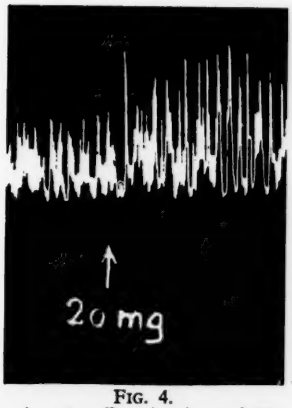

FIG. 4.
Showing the effect, in vitro, of 20 mg. cooper's fluke and worms drench powder on the small intestine of dogs.

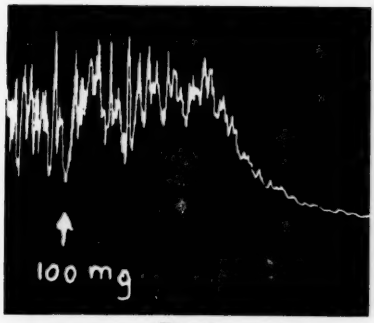

FIG. 5.
Showing the effect, in vitro, of 100 mg. of the fluke and worm drench powder on the small intestine of dogs.

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TABLE I.

In vitro effect of the compound fluke and worm drench powder on the motility of:—

Dose/mg. added to 50 ml. bath	*Fasc. gigantica of buffaloes*	*Diplyd. caninum of dogs*	*Asc. vitallorum of cows*	*Isolated intestines of cows and dogs*
0.5	No	No	No	No
1.0	No	Stimulation	No	No
2.0	No	Stimulation	No	No
5.0	Stimulation	Stimulation	No	No
10.0	Stimulation	Stimulation	Stimulation	Stimulation
20.0	Stimulation	Stimulation	Stimulation	Stimulation
50.0	Stimulation	Stimulation	Stimulation	Stim. followed by inhibition
100.0	Stimulation	Stimulation	Stimulation	Stim. followed by inhibition

N.B.: Not less than 5 experiments were done for each dose.

Discussion

Since the fluke and worm drench powder stimulates the activity of these worms *in vitro*, this may explain why the parasites are eliminated alive after the administration of this drug. It would appear that the preparation is not a vermicide but a vermifuge. The stimulation of the intestinal movements and the overstimulation of the parasites, demonstrated, *in vitro*, indicate the vermifugal property of this preparation. If the drug is administered in large amount, the intestinal motility may be inhibited. If intestinal motility is reduced or inhibited it is necessary to administer a purge in order to eliminate the parasite. Whilst this anthelmintic drug does not kill the parasites it is obnoxious to them and directly stimulates their musculature. The enhanced movements of the parasites may cause them to release their hold on the intestinal mucosa, so that they can be expelled easily by the already stimulated intestines. In some circumstances where the intestines are not affected by small doses or if movement be inhibited by large doses, the parasites may be expelled by a subsequent purgative.

Summary

The effect of a compound fluke and worm drench (powder) has been investigated on the motility of *Fasciola gigantica* of buffaloes, *Ascaris vitallorum* of cows, *Dipylidium caninum* of dogs, and on strips of intestinal muscles.

It seems that this preparation is an efficient anthelmintic for mixed parasitic infestation as it overstimulates these parasites and increases the intestinal motility.

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THE DISTRIBUTION OF THE RENAL ARTERY IN THE KIDNEY OF THE DOG

By IBRAHIM ARNAUTOVIC
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This short note is a synopsis of work carried out over several months by a visiting worker in the Department of Veterinary Anatomy of the University of Edinburgh.

Introduction

By virtue of their significance in bodily function, the kidneys have been subjected to investigation possibly more than any other organ in the body. Even so, there are still two schools of thought concerning the terminal arborisation of the major vessels within the parenchyma.

One school argues that all vessels which spring from arcuate and interlobular arteries terminate in the glomeruli, and maintains that the renal circulation is primarily glomerular in character.

The other asserts that, in addition to glomerular vessels, others spring from the same source to pursue a course entirely independent of the glomeruli.

Conflicting opinions are not limited to a consideration of the renal vascular pattern. For instance, few authors agree on the correct nomenclature of the major vessels in the human kidney. If any detailed information was available on the same vessels in the dog's kidney, no doubt similar arguments would arise. The nomenclature of these arteries varies from textbook to textbook, while in the small amount of literature available there is no adequate discussion of such points as the finer distribution of the larger renal vessels, their relationship with one another, or their field of supply. For this reason the main purport of this paper is an endeavour to find an answer to the following questions: —

1. What is the distribution of the renal artery in the dog? Does this distribution coincide with the nomenclature in the literature?
2. What is the relationship of the renal vessels to ureter, pelvis and pyramids?
3. Are there any arterial anastomoses in the kidney?
4. Does each vessel which springs from the renal artery have a distinct and separate field of supply?

Methods and Material

Sixty dogs were used for this investigation. In thirty of these the renal vessels and ureters were injected after Grahame (1944) to demonstrate the vascular tree and structure of the renal pelvis. The remainder of the specimens were dissected, cleared, and microscopic sections made with and without further injection of the vessels.

Observations and Discussion

The observations made and their discussion are of a lengthy nature, giving an extensive field of references. The chief of these are: Morison 1926; Ellenberger

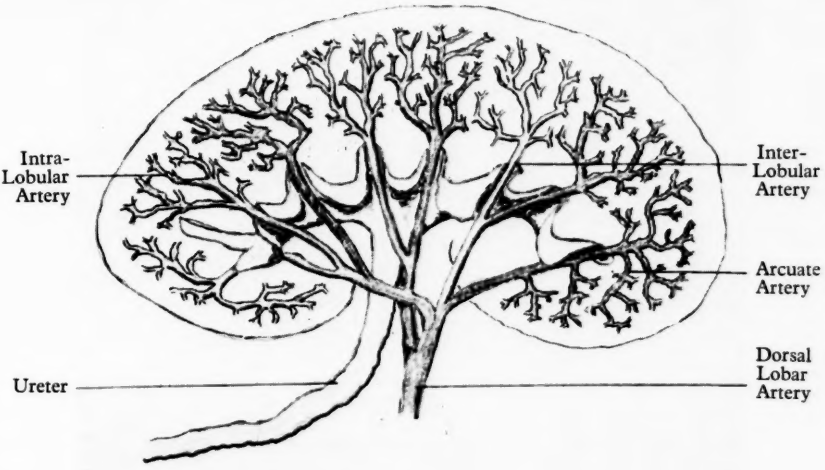

FIG. 1.
The relationship between vessels and calyces in the kidney of the dog.

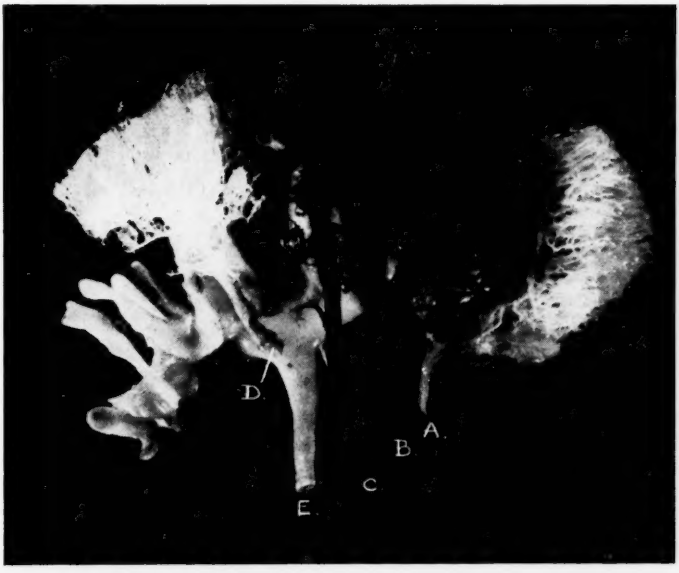

FIG. 2.
Corrosion cast of dog's kidney. A, B, C and D are interlobular arteries injected with different colours Vinylite solution. The ureter is labelled E.

(Article by Arnautovic, page 448)

1932; Grahame 1944, 1953; Sisson and Grossman 1953; Staubesand and Hammerson 1956; Benedetti 1957; Bradley 1959.

In most of the injected kidneys it was noted that the renal arteries bifurcated at one to one and a half inches from their origin. One branch ran to the dorsal half of the organ, the other to the ventral half. This arrangement was constant in all the specimens examined. Consequently these vessels may be termed *Lobar Arteries*.[1]

In the one hundred and twenty kidneys examined there were, in three instances, two left renal arteries springing from the aorta and, in one case, two right renal arteries had a similar origin.

On reaching the hilus, the renal arteries divide consistently into two branches. Each branch has a separate and distinct course extending from the hilus to the cortex. Each branch provides vascularisation to one half of the kidney. Careful microscopic study showed that the capillaries on either side were completely separate and in no case was an anastomosis noted between vessels of individual halves.

Thus logically each half kidney can be considered as having an independent blood supply. Varying terms are used in the literature to denote these vessels—anterior, posterior, superior, inferior, dorsal, ventral and middle if a third trunk is present.

Dorsal and ventral lobar arteries are the most appropriate terms in the dog by virtue of the posture of the animal and the position of the kidney.

There are two lobar arteries to each kidney and from the instances given above it can be seen that this number rarely varies. The number of renal pyramids or lobules however does vary depending on the size of dog. From the large number of kidneys examined it was estimated that each had an average of seven pyramids. It was observed that each pyramid received an interlobular artery from each lobar vessel. The average number of interlobular arteries in the kidneys examined during this investigation was fourteen.

That there was no anastomoses between interlobular arteries from the two lobar arteries or indeed between any juxta vessels, was determined conclusively by injecting each interlobular artery with solutions of different colours. It was noted, however, that an occasional branch from an interlobular vessel passed directly through the cortex to anastomose with an adrenal vessel or to become lost in perirenal fat, which fact agrees with the findings of Stokoe (1958), in the sheep.

Each interlobular artery gives origin to several arciform vessels. From these spring the intralobular arteries which in turn give rise to the afferent vessels forming the glomeruli.

In contradiction to statements in most textbooks on the subject, the ureteric artery was found to spring from the interlobular arteries and not from the renal artery.

Summary

The following conclusions sum up the work and provide an answer to some of the problems of kidney vascularisation which have long required investigation.

1. An attempt has been made to apply nomenclature most suitable and applicable to the vessels of the kidneys of the mammalian group.

XUM

2. The renal artery divides into two branches which are named the lobar arteries (dorsal and ventral).
3. Each lobar artery divides into an average of seven branches, each of which runs between the medullary pyramids. These branches are termed interlobular arteries. arteries.
4. The interlobular arteries give origin to the arcuate vessels. These in turn give off vessels called intralobular arteries which traverse the cortex, eventually giving rise to afferent, glomerular and afferent vessels.
5. No anastomoses were noted between lobar, interlobular or intralobular arteries.
6. The number of medullary pyramids or lobules present depends directly on the size of the dog. Each kidney possesses half as many pyramids as interlobular arteries. Thus each pyramid or lobule has its own distinct and separate vascularisation.
7. The ureteric artery which supplies the first part of the ureter arises from the interlobular artery and not directly from the renal as described in most anatomical textbooks.

Acknowledgments

This work was carried out under the supervision of Mr. T. Grahame, Head of the Department of Veterinary Anatomy, University of Edinburgh, to whom I wish to express my gratitude for his co-operation and helpful suggestions.

I also wish to express my grateful thanks to Dr. W. M. Stokoe for his untiring efforts in translating and editing this work. My thanks are also due to Mr. R. Hood for the excellent photographs and to Mr. E. Roberts for his technical assistance.

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[1] This work was widely discussed at the III Meeting of Yugoslav Anatomists, held on September 27, 28 and 29 this year. After the active discussion, the Meeting recommended the following nomenclature: a. renalis communis, aa. renalis dorsalis et ventralis, aa. lobares, aa. lobulares, instead of a. renalis, aa. lobaris dorsalis et ventralis, aa. interlobulares, aa. intralobulares about which a Summary will be written in a subsequent issue of *Acta anatomica.*

CHRISTMAS IS A TIME TO THINK OF THOSE IN NEED

When the days are long and the sun is bright and warm people tend to wander afield and go their separate ways. When the nights are long and the sun is dull and it is cold and the wind wails in the trees they gather together around the fire to share the joys of a well-stocked larder in an atmosphere of amity and good cheer. In this way people come closer together not only in the physical sense but in sentiment also. This has been the custom of men on the darkest days of the year since the beginning of time, and there can be no doubt that when our ancestors huddled around the communal fire in their cave, safe from the elements and their predatory foes, they glowed not only with warmth but with good companionship also. No doubt conscious of their own security they would spare a thought for those who were in need or peril and were still abroad. Anxious eyes would be turned towards the door so that returning wanderers could be assured of a welcome and there could be immediate succour for those in need. Primitive people are not without the merit of an acutely perceptive mind and no doubt it was not long before it was appreciated that this time of concourse and refuge betokened the ending of darkness and depression and that in the succeeding days nature would begin to open out again in all her glory. Pagan theologians were superb psychologists and it was not long before they brought this annual time of concourse with its good companionship and cheer to the status of a feast dedicated to the praise of one or other of their dieties.

When the Christian theological doctrine swept through the world the leaders, also wise to the value of the psychological approach, adopted many of the established Pagan occasions and customs to their own ends and the greatest of all these was the saturnal feast at the end of the year which we now call Christmas. The secular celebrations have altered in character only in a circumstantial way but the spiritual side of this festival has undergone great change. It is now a time when the spirits of love, compassion and benevolence are in the ascendant and we remember the birth of He whose life and teachings revolutionised the whole concept of man's relationship with the diety and with his fellows. Only the meanest of men can ignore their neighbours completely and on them we will not waste our words. Fortunately the average man is a good citizen who observes his duty to his neighbour and especially so when the latter is in trouble or distress. This urge to help is manifested most at Christmastide and when families gather together.

This December when you are preparing to gather together in a happy family circle in your homes spare a thought for those who cannot hope to share such joy; the old men who have borne the burden of the day, the widows, the orphans, and those disabled by accident and illness.

Many sad cases come to the notice of the benevolent funds. The profession is now in good times, no one who has qualified during the recent twenty years and maintained his or her good health can have experienced the pangs of poverty and near destitution. Many of the applicants for assistance passed their active life in a time when it was not easy to provide for their immediate needs and it was impossible to make provision for the future.

Let us hope that no veterinary surgeon, or his dependants, suffer the misery of a bleak and miserable Christmastide. The benevolent funds are willing and anxious to do their part, let us see that they do not fail for want of finance.

XUM

CORRESPONDENCE

December, 1959.

To the Editor, The British Veterinary Journal.

Sir.

Christmas is a time of goodwill amongst men, and as it approaches we would like to take the opportunity to thank your readers for their generous support in the past and to remind them again of the Christmas Gift Account of the Victoria Veterinary Benevolent Fund.

It is from this account that the fund is able to send monetary gifts to veterinary surgeons, or their widows, who are in need, so that they too can share some of the joy of the great festival. Each year we receive many letters in which the recipients express their sincere gratitude to those who have made it possible for them to enjoy some of the comforts and pleasures of Christmas.

We ask all who may read this letter, and we hope that every member of the profession will do so, to help the V.V.B.F. to bring a little additional comfort and joy into the homes of those who need it most. Benevolence and compassion are two of the greatest attributes a man can possess so open your hearts and give as generously as you can to a worthy cause. Please send your contributions to the Secretary, V.V.B. Fund (Christmas Gifts), 10 Red Lion Square, London, W.C.1. There may be some who would prefer to send a Christmas parcel to one of the Fund's recipients, if so the Secretary will be pleased to supply a name and address.

Yours Sincerely,

H. W. DAWES, *President.*
J. McCUNN, *Hon. Treasurer.*
J. J. DUNLOP, *Hon. Secretary.*

Victoria Veterinary Benevolent Fund,
10 Red Lion Square,
London, W.C.1.

The F.A.O. Mission,
Box 10 39,
Addis Ababa,
Ethiopia.
4th November, 1959.

The Editor,
The British Veterinary Journal,

Gentlemen,

I have your issue of August, 1959, to hand and have read the Editorial and I do not at all demur from its theme, but it raises a question which has often recurred to my mind. Surely an enormous number of horses are unnecessarily and inadvisedly shod?

It has been my lot to have to do with horses in various parts of the world and, so far as I can recollect, the only times that it has been *necessary* to shoe horses have been when they were employed on city streets and on frozen ground, but no doubt there are other occasions. Certainly light horses can be worked in rough mountain country unshod without hurt and, *when* they are accustomed to it, the growth of hoof is

stimulated and it is necessary to trim the feet from time to time. Is it true therefore (quoting from your Editorial) that " horses must be shod "? Is it not more true to say that occasionally, and only when necessary, horses should be shod? Is it necessary or good to shoe the feet of normal healthy horses? Prophylactic and therapeutic shoeing are of course different matters.

If you consider that this note raises an issue of general interest, I shall be grateful for any comments which you or your readers may make. I will be interested to know if there is support for my contention that there is much overshoeing. Unshod horses are freer from foot and leg troubles than shod horses and of course they are less costly to keep. The latter factor is a point of importance in the pony club world.

Yours faithfully,

EDWARD F. PECK

REVIEWS

REPRODUCTION IN DOMESTIC ANIMALS, VOLUME 2. Edited by H. H. Cole and P. T. Cupps, 1959. New York and London. Academic Press. 426 pages, 54 illustrations and many tables. Price $13.00.

This second volume of this work is a worthy successor to Vol. 1, and it can be recommended to veterinary students, veterinary surgeons and research workers.

As in Vol. 1, the authors are experts in their various fields and the survey is up to date.

Chapters 1 and 2 deal with spermatogenesis, the morphology of spermatozoa, the biochemistry of semen and secretions of the male accessory organs.

Chapters 3 and 4 discuss libido in the male and the various methods and techniques employed in the collection, dilution and storage of semen.

Chapter 5 relates the general considerations in insemination procedures and the techniques involved in each individual species.

Chapters 6 and 7 describe the effects of nutrition and environmental factors on reproduction.

In chapters 8 and 9 the factors affecting fertility, whether they be anatomical, physiological or diseases, are discussed.

Chapters 10 and 11 deal with reproduction in the domestic fowl, and a full description is given.

The book is produced well and the references are excellent. One small criticism is offered. It could have been more amply illustrated.

THE EXAMINATION OF ANIMALS FOR SOUNDNESS. R. H. Smythe. London. Crosby Lockwood & Son, Ltd. 13/6d.

For many generations the examination of horses for soundness was one of the most important tasks that a veterinary surgeon could be called upon to perform. Reputations could be won or lost according to a man's ability and integrity in this work. The present high esteem in which the profession is held was founded upon the rectitude, competence and good judgment which veterinary surgeons manifested in this task. The high regard for the verb " to vet " was born of the horse owners' respect of our forebears.

Until quite recent times veterinary science was orientated around the horse, for that animal was an essential factor in the economic life of the world. It has been said that civilisation began with the domestication of the horse and the invention of the wheel. When horses were ubiquitous examinations in regard to their soundness were common incidents. College quadrangles and veterinary surgeon's yards resounded to the clatter of shoes. A vast fund of knowledge was accumulated and a young graduate of reasonable ability could soon become competent in this rather specialised task.

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In recent times, owing to the sad decline in the horse population, examinations for soundness have become the exception rather than the rule, and our young men and women do not have the opportunity to enhance their knowledge in the school of personal practical experience. It is good therefore that R. H. Smythe has collected and recorded much of the lore that was passed on to him and has set down also those things which have been born of his own experience. His account is concise and phrased in good conversational language. His system is one which ensures that no part can be neglected. Experienced men will read his words with great interest, no doubt also with some nostalgia, young men who are interested in horses will devour it.

Smythe describes also his methods for the examination of cattle and he has called in two experts J. K. Bateman and Margaret Bentley, to deal with dogs and cats. For economic and sentimental reasons these animals are becoming more and more important and owners, and particularly prospective purchasers, look to their veterinary surgeons to guide them when they require an assessment of health and quality.

In the main, the plan of action in the examination of any animal is on lines similar to those employed in regard to the horse. If Veterinary Surgeons continue to exhibit the same degree of competence and integrity in these examinations as was the custom with regard to horses, the verb " to vet " will retain its high prestige and meaning and run no risk of being denigrated to the status of the verb " to doctor ".

POULTRY DISEASES. Fritzsche & Gerriets. Berlin/Hamburg. Paul Parey. 390 pp. D.M.49.

A new text book on the diseases of poultry is certain to be of interest to the small group of veterinarians who have specialized in this field of veterinary science and it is unfortunate that the contents of the work under review are at the moment only accessible to the English reader with a knowledge of German; the book contains much of interest to the veterinary student and practitioner wishing to extend his knowledge of poultry diseases. It is clear from the authors' preface that the position in Germany is somewhat similar to that in Great Britain: in both countries a rapidly expanding poultry industry presents fresh fields and opportunities as well as a challenge to veterinary professions, which at the present time, they are unfortunately not yet in a position to accept. In Germany today the hen takes third place behind cattle and pigs in the agricultural economy, whilst in the United Kingdom the value of poultry produce now exceeds that of pigs and is second only to that of milk and dairy produce.

As far as the German veterinary student and practitioner is concerned, this new book will go a long way to filling the gaps in his knowledge and professional training. It includes reference to the current disease problems in America and Britain most of which seem to have been encountered in Germany. But the authors do not make the mistake, not uncommon in veterinary text books, of confining themselves to a description of the diseases and their treatment. They emphasise the vital importance of a basic training in poultry management, feeding and hygiene if the veterinarian is to be fully effective in preventing and controlling disease. The first part (approximately 50 pages) of this book is concerned entirely with the different methods of modern poultry management and the seventh and ninth parts (another 50 pages or so) are concerned with the principles of feeding and with deficiency diseases. Nearly 100 pages each are devoted to virus and bacterial diseases; parasitic diseases, poisoning, genetical conditions, digestive disorders, a short section on vices, and finally a description of surgical techniques make up the rest of the book.

The authors have managed to provide a completely up-to-date account of avian diseases, their diagnosis and control which cannot fail to be of the greatest value to the veterinary student and practitioner, particularly to those of them who are unable to read text books and scientific publications in the English language but it contains little of interest to the research worker. Most of the text of the book is based on the publications

of workers in America and Britain and here the value of the book is somewhat limited owing to the rather narrow selection of references.

The book is attractively bound, well printed and is liberally supplied with black and white photographs and two colour plates.

NEWS

MASS INOCULATION AGAINST DISTEMPER

Mink, like dogs, suffer from distemper.

The Wellcome Foundation received an urgent request for quantities of ' Epivax ' distemper vaccine sufficient to inoculate 6,500 mink on a ranch in East Scotland. This is the biggest mass inoculation of small animals that has taken place in the U.K.

In this instance distemper of the hard-pad type had been reported in dogs in a village near the ranch and the owner decided to run no risks. In mink, distemper is much more likely to be fatal than it is in dogs. Indeed, once it is confirmed that a mink is suffering from distemper, there is little hope that it will survive. The answer is inoculate them so that they do not contract the disease.

FORENSIC SCIENCE

A decision to form a Forensic Science Society was taken at a well-attended meeting held at Nottingham University on October 31st. The object of the society is to advance the study and application of forensic science in all its branches. With this aim in view, a series of symposia, to be held alternately in London and in the provinces, is being arranged. Among the subjects suggested for discussion are Blood, Hypoglycaemia, Street Accidents, and Instrumentation.

All persons professionally interested in forensic science are eligible for membership. The president of the Society is Dr. J. B. Firth, and the secretary Dr. E. G. C. Clarke of the Royal Veterinary College, London, N.W.1, from whom further information can be obtained.

BOOTS OPEN NEW £750,000 RESEARCH CENTRE

A new biological research centre which cost £750,000 to build and equip was opened in Nottingham by Boots Pure Drug Co. Ltd. on Tuesday, 22nd September. The seven-storey building with its 24 laboratories will provide the most up-to-date facilities in Britain for research in pharmacology and chemotherapy and for analytical and control work in the bio-assay and micro-biology divisions of the company's standards department. With a total of 88,000 square feet of floor space, the new building is situated in Pennyfoot Street, close to the centre of Nottingham and not far from Boots' headquarters in Station Street.

The erection of this new biological centre is part of a general programme of modernisation and expansion of the company's research facilities. Medical research at Boots has been expanding rapidly in the years since the war and within the last three years alone there has been an increase of 25% in graduate staff engaged in this work. Space has been allowed in the new building for a further increase of 50%.

The building also houses the company's scientific library of 25,000 volumes, believed to be the largest owned by any pharmaceutical company in Great Britain, and includes a new lecture theatre to seat 200.

In addition to increased space and new equipment, many advantages will be gained from housing under one roof related work that has previously been scattered.

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NOTICES

'DISTAVONE' SUSPENSION VETERINARY

The Distillers Company (Biochemicals) Limited has introduced the above new product which contains 300,000 units procaine penicillin G with 0.25 gm. dihydrostreptomycin (as sulphate) in each ml. Vials of 25 ml.

'Distavone' Suspension Veterinary is ready-prepared and will be a welcome addition to the veterinary surgeons' armamentarium in treating many mixed infections which they meet daily in their practice. The product has a life of 18 months.

Supplies may be obtained direct from the manufacturers or from your usual wholesaler.

JOHN WYETH & BROTHER LIMITED

It is announced that the above firm is to enter the veterinary field. The two main products they will be launching are 'Sparine' (promazine hydrochloride), for trouble-free sedation and calming of large and small animals, and 'Penidural' (benzathine penicillin B.P.), a convenient and time-saving, single penicillin injection to achieve 7 to 10 day effective blood levels. Initially, only medical packs of these products will be readily available, but the company plans to announce details of special veterinary packs in the near future.

Publisher's Notices

THE BRITISH VETERINARY JOURNAL, with which is incorporated THE VETERINARY JOURNAL, is published monthly, and copy for advertisements should be in the hands of the advertisement manager not later than the 16th of the preceding month, if proof is required. Tel.: Temple Bar 3386, 7, 8 & 9.

Letters for the Journal, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

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